



Implementing Advanced Concepts for Biological Utilization of Waste

Biorefineries in the EU policies

**By Reljo Saarepera
ERKAS**



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reljo@erkas.ee

BIOREFINERIES

- Basically understood as biofuel production (similar to gasoline refinery) or as a waste treatment centre
- Priority in energy security, feeding the world, waste management
- We go for bioreactor
- Many lobbyists trying to make it “their thing”



THERE ACTUALLY IS A STRATEGY...

- Innovating for Sustainable Growth: A Bioeconomy for Europe
http://ec.europa.eu/research/bioeconomy/pdf/201202_innovating_sustainable_growth.pdf
- The Bioeconomy Strategy: three key pillars
 - 1) Investing in research, innovation and skills
 - 2) Market development and enhanced competitiveness of bioeconomy sectors
 - 3) Stronger policy coordination and engagement with stakeholders

[http://europa.eu/rapid/press-release MEMO-12-97_en.htm](http://europa.eu/rapid/press-release_MEMO-12-97_en.htm)



PREVIOUS PROJECTS HAVE DISCOVERED:

- BIOREFINERY EUROVIEW (Current situation and potential of the biorefinery concept in the EU: strategic framework and guidelines for its development http://cordis.europa.eu/result/rcn/47386_en.html)
- Biorefineries and reactors are tested in following sectors:
 - chemical industries (including biotechnology)
 - sugar and starch sector
 - forestry sector (including pulp and paper)
 - biofuels sector



News Alert

Commission steps up biomass use – Nearly € 80 million for biorefinery research

Brussels, 4th March 2010

A major research initiative of the European Commission about the sustainable use of biomass has started today. Researchers and industry are going to develop new ways to convert biological feedstock into energy and valuable material using biorefinery technology. The Commission will fund the programme with € 52 million for 4 years. 81 partners from universities, research institutes and industry in 20 countries will invest an additional € 28 million.

The programme will contribute to the European Lead Market initiative on Bio-Based products. It aims to facilitate the translation of technological and non-technological innovation into commercial products and services. Biorefinery research will also contribute to the implementation of the European Energy & Climate Package. The goal is that by 2020 transport in every Member State will use a minimum of 10% renewable energy – especially biofuels. Biorefinery is also an important feature of the Bio-energy European Industrial Initiative, one of the six industrial initiatives of the European Strategic Energy Technology (SET) Plan. Its objective is that by 2020 at least 14 % of the EU energy mix will be bio-energy. More than 200 000 local jobs could be created as a result.

Multidisciplinary research is needed to achieve the full potential of biomass, so the Commission is bringing together the most advanced developers in Europe of biorefineries. On the energy side they are developing new methods to convert biomass into so called second generation biofuels in which feedstock doesn't compete with food production and which will produce heat and electricity. The other approach is to crack the components of biomass in order to produce chemicals and materials.

Three large collaborative projects will address the entire value chain from the production of biomass, logistics, intermediary processing steps and its conversion into end-products with the feasibility of the techniques shown at pilot scale. One coordination action project will provide immediate support to and coordination of ongoing biorefinery research projects with potential high impact, as well as providing a framework for collaborations and information exchange, a common vision and a roadmap for 2020.

Contacts :

EC press officer: Florian FRANK, florian.frank@ec.europa.eu, Tel.: +32 2 29 97934

EC Scientific Officer: Maria GEORGIADOU, maria.georgiadou@ec.europa.eu, Tel: +32 2 29 59846



BIOREACTOR IN BSR STRATEGIES AND PROJECTS

In projects:

- A necessity for “blue energy”
- A priority in waste water/manure treatment

In strategy:

- No direct priority in the BSR strategy but it is a living document
- No direct call in the next BSR program but bioreactors fit within larger framework of sustainable energy production and waste reduction activities



BIOREACTOR FUNDING IN EU LEVEL

- Fundamental for blue energy
- Integral part for smart waste treatment and production systems
- Financed by many Horizon 2020 calls if approached as:
 - Energy solution
 - Waste management solution
 - Novelty technology
 - Self-sustainable community



A Bioeconomy for Europe

Using resources from land and sea
for a post-petroleum economy

European Bioeconomy: strategy and action plan

Timothy Hall
Head of Unit
Agriculture, Forestry, Fisheries and Aquaculture
Directorate-General Research & Innovation
European Commission

Building bioeconomy in Europe

<http://ec.europa.eu/research/bioeconomy/>

The presentation shall neither be binding nor construed as constituting commitment by the European Commission



The Bioeconomy

Using research and innovation to produce renewable raw materials sustainably in **agriculture, forestry, fisheries and aquaculture...**

...and to process renewable raw materials into value added products in the **food, bio-based and energy industries.**

Bioeconomy: What is at stake?

- Ensuring food security by increasing the resilience, sustainability and productivity of primary production systems and the food chain
 - Reducing dependence on fossil resources
 - Managing natural resources sustainably and moving towards a zero-waste society
 - Mitigating and adapting to climate change
- Building competitive Bio-based industries in Europe

Forest-based sector as part of the Bioeconomy (1)

- Forests covers around **40% of the total EU territory**, i.e. 177 million ha, of which 130 million ha are available for wood supply and the production of non-goods and services.
- The EU is one of the few regions in the world where **forest area is growing** (700,000 ha annually)

The forest sector can contribute to tackle climate change and depletion of fossil resources:

- Forests store CO_2 from the atmosphere, thus counteracting GHG emissions and mitigating climate change. The annual carbon sequestration in European forests is equivalent to around 9% of the EU's GHG emissions (UNECE)
- Harvested wood products (HWP) store carbon (0,225 tC/m³ of roundwood) and substitute other non-renewable and more carbon-intensive products.
- The forest-based sector can play an important role as producer of renewable energy, providing heat and electricity and producing wood-based biofuels.

Forest-based sector as part of the Bioeconomy (2)

- The **growing stock is also increasing**, ➡ only around 68% of the annual timber growth is harvested.
- **More stem wood and residues could be economically mobilised** without negative ecological impacts.
- Forests can respond to the increasing demand for biomass and improve the **competitiveness** of rural areas.

Forest-based industries are a good example of the Bioeconomy:

- Around 90% of woodworking industries's raw material comes from sustainable EU forests.
- About half of the EU paper production is based on recovered paper ➡ Europe is world leader!
- Biorefinery operations are being integrated in the pulp and paper making process, contributing to a more efficient use of wood for both forest products and energy
- The sector is the largest producer and consumer of renewable bio-energy

FP7 research: project FORBIOPLAST

High value materials for the automotive, packaging and agricultural industry...

Soft Polyurethanes



Tomato yarn



Rigid Polyurethanes



Pots



T-bone



Spoiler



Packaging



www.forbioplast.eu

© FORBIOPLAST

...**produced from forestry resources and industry by-products** using industrial biotechnology



The Bioeconomy Strategy and Action Plan

Commission Communication COM(2012) 60 - «Innovating for Sustainable Growth: A Bioeconomy for Europe»

**INVESTMENTS IN RESEARCH,
INNOVATION AND SKILLS**

**REINFORCED POLICY INTERACTION
AND STAKEHOLDER ENGAGEMENT**

**ENHANCEMENT OF MARKETS AND
COMPETITIVENESS IN BIOECONOMY
SECTORS**

EU Institutions

Member States
and Regions

Stakeholders
public & private sectors

International
partners &
organisations



INVESTMENTS IN RESEARCH, INNOVATION AND SKILLS

1. Ensure substantial EU and national **public funding** and **private investment for bioeconomy and innovation**;
2. Increase the share of **multi-disciplinary and cross-sectoral research and innovation**;
3. Promote the **uptake and diffusion of innovation** in bioeconomy sectors; create feedback mechanisms on regulation and policy;
4. Build the **human capacity** required to support growth and integration of bioeconomy sectors;



REINFORCED POLICY INTERACTION AND STAKEHOLDER ENGAGEMENT

5. Create a **Bioeconomy Panel to enhancing synergies and coherence between policies**; foster participation of researchers, end-users, policy-makers and civil society;
6. Establish a **Bioeconomy Observatory** and develop forward-looking and modelling tools;
7. Support the **development of regional and national bioeconomy strategies**;
8. Develop **international cooperation** to jointly address global challenges (e.g. food security, climate change);

A policy interaction model for the bioeconomy

Bioeconomy Panel – Flexible discussion platform

- Supports interactions for
- Advice on implementation of the Strategy
 - Suggestions for European joint actions and measures
 - Monitoring and evaluation of progress
- Involves actors from
- EC services (incl. RTD, AGRI, ENTR, ENV, MARE)
 - MS representatives from relevant ministries
 - Stakeholders representatives (industry associations; scientific community; farmers, foresters, fishermen; NGO)

Informed dialogue

Bioeconomy Stakeholders' Conference

Awareness raising and informed dialogue for:

- Researchers
- Stakeholders
- Policy makers
- Civil society

Support to monitoring and policy-making

Bioeconomy Observatory

- Capacity mapping
- Technology watch
- Bioeconomy policy outlook
- Market monitoring
- Forward looking activities

Expertise through ad-hoc hearings

- Existing working/advisory groups and committees (e.g. SCAR, AG for LMI on bio-based products)
- Stakeholders groups
- EIP; Publ-Publ Partnering; Publ-Priv Partnerships



ENHANCEMENT OF MARKETS AND COMPETITIVENESS IN BIOECONOMY SECTORS

- Provide knowledge-base for sustainable intensification of primary production; **improve understanding of biomass/biowaste availability and demand**;
- Promote the setting up of networks for integrated and diversified biorefineries; establish a **PPP for bio-based industries**;
- **Support expansion of new markets**; facilitate green procurement for bio-based products;
- Develop science-based approaches to **inform consumers** about product properties).

Information on the Bioeconomy

➤ Bioeconomy Website

http://ec.europa.eu/research/bioeconomy/index_en.htm

Other links

FP7

<http://ec.europa.eu/research/fp7/>

Participant portal

<http://ec.europa.eu/research/participants/portal/page/home#>

Horizon 2020

http://ec.europa.eu/research/horizon2020/index_en.cfm



THANK YOU!



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